

# Amphibians from Serrania de Las Quinchas, in the mid-Magdalena river valley, Colombia

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## Abstract

We studied the species of amphibians from Serranía de Las Quinchas, in the mid Magdalena Valley region of Colombia, comparing the data from a recent fieldwork with museum records and literature. We present a list of 50 species of amphibians (Anura and Caudata). In our survey, we recorded 36 species, of which 6 represented new records. One of the most interesting record is that of the genus *Oedipina*, since this is the first time the genus is recorded for the Cordillera Oriental. The number of species is what would be expected in a humid tropical forest of the mid-Magdalena river valley, given the co-occurrence of amphibian faunas distributed in the sub-Andean, Caribbean, and Chocó biogeographic regions.

## Key words

Boyacá and Cundinamarca departments, frogs, humid tropical forest, *Oedipina*, species richness.

**Academic editor:** Marcelo Nogueira de Carvalho Kokubum | Received 16 August 2018 | Accepted 26 February 2019 | Published 17 May 2019

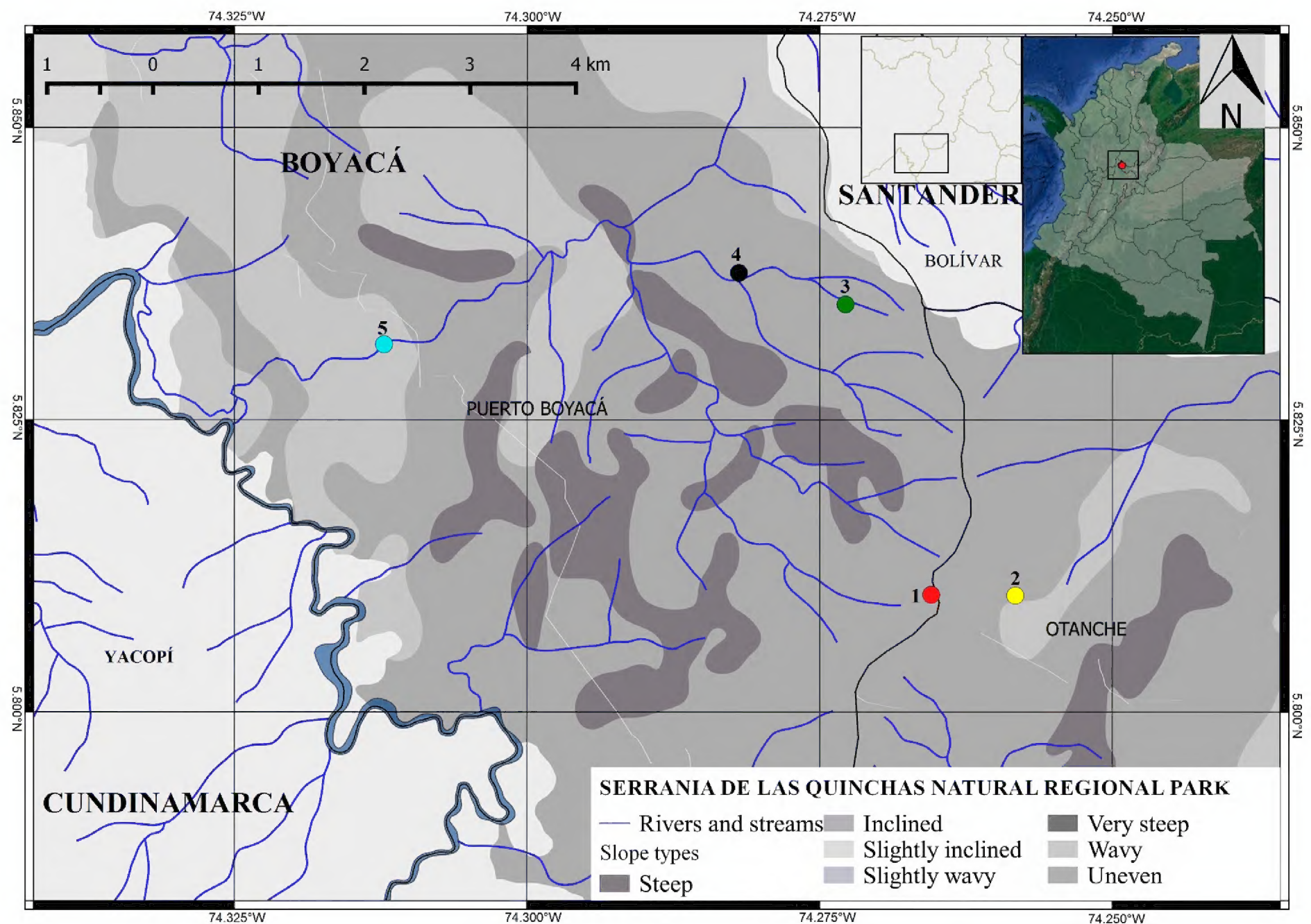
**Citation:** Ovalle-Pacheco A, Camacho-Rozo C, Arroyo S (2019) Amphibians from Serrania de Las Quinchas, in the mid-Magdalena river valley, Colombia. Check List 15 (3): 387–404. <https://doi.org/10.15560/15.3.387>

## Introduction

There are currently 821 species of amphibians reported for Colombia, being the country with second-highest species richness, after Brazil (Acosta-Galvis 2000, 2019, Frost 2019). Geographic position, bioclimatic conditions and orographic complexity have conditioned habitat heterogeneity for the development of these organisms, and these are factors related with their enormous diversity (Ruíz-Carranza et al. 1996, Acosta-Galvis 2000). Nonetheless, the transformation of natural habitats by agricultural systems to supply the increasing human population has intensified, taking over the gross

primary productivity of terrestrial ecosystems (Etter et al. 2011), leading to deforestation and change of use of soil in tropical forests (Dirzo and García 1992, Laurance et al. 2002). In Colombia, between 1985 and 2000, the areas that showed one of the highest increases in agricultural activities were the Cordillera Oriental and the Magdalena Valley (Rodríguez-Eraso et al. 2013). These processes have negative implications for conservation because both of these regions are considered as hotspots of biodiversity (Myers 1998). The fragmentation, loss and degradation of tropical forest habitats is one of the primary causes of the amphibian population declines in Colombia. Such a situation makes it necessary to conduct





**Figure 1.** Map of the study area, Serranía de Las Quinchas National Natural Park. Points show the sampling stations. Station 1, sub-Andean forests (red point). Station 2, riparian forest vegetation (yellow point). Station 3, humid pre-montane forest (green point). Station 4, primary humid tropical forest (black point). Station 5, pastures and agriculture areas with small relicts of tropical humid forest (blue point).

periodic biological inventories to establish the status of biodiversity and for assessing changes in it.

The Serranía de Las Quinchas is one of the last relicts of vegetation typical of the mid Magdalena River drainage, with Humid Tropical Forests (between 0 and 700 m elevation) and very Humid Premontane Forests (between 800 and 1000 m elevation) (Balcázar-Vargas et al. 2000, Cortes- Rincón 2013). The Serranía is an ecosystem of biogeographic importance, located on the western flank of the Cordillera Oriental of the Colombian Andes in the municipalities of Puerto Boyacá and Otanche (Boyacá Department), Yacopí (Cundinamarca Department), and Bolívar (Santander Department). The biological elements of the wet part of the Magdalena river valley are more related to elements of the north of Colombia and the trans-Andina region, than to the cis-Andina region, notwithstanding their geographic proximity (Laverde et al. 2005, Acosta-Galvis and Rada 2006, Acosta-Galvis 2012a).

First research expeditions of the amphibian fauna of Las Quinchas were made around 1990s and deposited in collections of the Universidad Nacional de Colombia, Universidad Industrial de Santander, Instituto de Investigación de Recursos Biológicos Alexander von Humboldt and the Pontificia Universidad Javeriana. In that decade, 29 species of amphibians were recorded, but the fauna still remains poorly known (Acosta et al. 2006). Here we present the results of an inventory made along

an altitudinal assessment in different seasons with the purpose to detect species composition beside the first inventories, and to begin a monitoring conservation plan about the status of the amphibian fauna.

## Methods

**Study area.** At Serranía de Las Quinchas, the altitudinal gradient varies from 250 m in the Magdalena River, up to 1500 m a. s. l. (Balcázar-Vargas et al. 2000). Sub-Andean tropical life zones are present under 1000 m elevation, while Andean life zones are represented between 1000 and 1500 m elevation. Average temperature is 27 °C and relative humidity average is 79% in the low zones, while average temperature is 23 °C and relative humidity average is 88% in the high zones. Rain regime is bimodal, with rainy seasons between April to May and September to October.

Sampling was done at 5 stations along a gradient between 250 m a.s.l. (05°49'23.3" N, 074°21'04.2" W) and 1450 m a.s.l. (05°48'36.1" N, 074°15'57.7" W) (Fig. 1). Characteristics of the stations are explained as follows. Station 1: steep slopes with primary sub-Andean forests (1300–1450 m elevation); Station 2: Riparian forest vegetation (1050–1250 m elevation); Station 3: Steep slopes and abundant undergrowth in humid pre-montane forest (750–1000 m elevation); Station 4: primary humid



tropical forest with trees above 40 m of height (500–749 m elevation); Station 5: Slightly steep terrain with pastures and agriculture areas with small relicts of tropical humid forest, where agriculture and ecotourism practices are developed (250–450 m elevation).

**Data collection.** Three 30-day field trips were made in the months of June to July, October to November 2016 and February to March 2017, covering the dry, transitioning and rainy seasons of the year. Two methods of sampling were employed, the first being the search along transects of  $100 \times 2$  m in each of the vegetation coverings selected, each transect separated by 80–100 m. The second method was a randomized visual encounter survey (Heyer et al. 1994), which allowed us to record a high numbers of species in a short term study and to document more unique species of amphibians at night (Doan 2003).

All types of available microhabitats (like stream beds, vegetation bordering the streams, leaf litter, decomposing logs, rocks, permanent ponds, temporary bodies of water, among others) in the different kinds of habitats surveyed were searched carefully. Individuals were collected manually following biosecurity protocols by Angulo et al. (2006). Two collectors made diurnal (between 0900 and 1300 hours) and nocturnal (between 1900 and 2300 hours) sampling during 6 days per station, to add a total sampling effort of 96 hours/collector per station.

Collected specimens were euthanized with 2% Lidocaine and fixed in 10% formalin solution and preserved in 70% ethanol following the protocol by Simmons (2002). All collected individuals were photographed in life. Vouchers will be deposited in the Luis Gonzalo Andrade Museum of Natural History of the Universidad Pedagógica y Tecnológica de Colombia (UPTC), in Tunja, Colombia. While assigning a museum collection code, collector's tag is displayed (ALOP, Andrés Ovalle-Pacheco). Amphibian nomenclature follows Frost (2019) and identification was done up to the level of species by reviewing the original descriptions of the species along with reference collection at the Instituto de Ciencias Naturales of the Universidad Nacional de Colombia (ICN) to corroborate the taxonomic identification.

## Results

Fifty species of amphibians (48 frogs and 2 salamanders) belonging to 25 genera, in 11 families and 2 orders are known from Serranía de Las Quinchas (Appendix, Table A1). During our fieldwork we observed 36 species. Of these 36 species, we provide new records of species for the Serranía, of which *Hyloxalus vergeli*, *Rulyrana adiazeta* and *Scinax caprarius* are new reports for the department of Boyacá, as well as the genus *Oedipina*. Twenty-eight (28%) of the amphibian species reported from Serranía de las Quinchas are endemic to Colombia. *Cryptobatrachus fuhrmanni*, *H. vergeli*, *P. bicolor*,

*R. adiazeta* and *Bolitoglossa lozanoi* are listed as Vulnerable because of habitat loss and degradation due to agriculture (IUCN 2018). We were not able to assign 7 records to any valid species (Appendix, Table A1), and one that is of particular interest in this work. The new record of the genus *Oedipina* in the Magdalena river valley in Colombia raises biogeographical questions, as the closest record for the genus corresponds to *O. parvipes*, 213 km away, in the northern part of the department of Antioquia in the Cordillera Central. This suggests that there are still many gaps in primary information about the amphibian composition of Colombian well-preserved forests.

The two most representative families are Hylidae (12 species) and Craugastoridae (10), followed by Leptodactylidae (7), Centrolenidae (5), Bufonidae and Dendrobatidae (4 species each), Aromobatidae and Hemiphractidae (2 species each). The families Ranidae and Phyllomedusidae are represented by 1 species each. Two species of plethodontid salamanders are reported, 1 species in the genus *Oedipina* and another in the genus *Bolitoglossa*.

Despite the fact that our sampling was made in 5 stations along an altitudinal and ecological gradient, widely distributed species like *Allobates niputidea*, *Dendropsophus ebraccatus*, *Hyalinobatrachium colymbiphyllum*, *H. valerioi*, *Leptodactylus fuscus*, *L. insularum*, *Scarthyla vigilans*, *Scinax ruber*, *Smilisca phaeota*, *Pseudopaludicola pusilla*, *Trachycephalus typhonius*, and *Caecilia thompsoni* were not recorded, as opposed to the observations by Acosta-Galvis (2006), Acosta-Galvis (2012a) and Ospina-Sarria et al. (2015). These species inhabit altitudes between 50 and 1000 m of elevation (Bernal and Lynch 2008), where agriculture and grasslands are predominantly found, with small relicts of tropical wet forest. Since the beginnings of the 80s, sugar cane, plantain, corn and yuca have been produced, followed by cotton and rice (Balcázar-Vargas et al. 2000). Oil palm plantations have begun to settle in the region after the year 2000. These activities affect the microhabitats and water bodies (like permanent and temporary ponds) in a direct way, which are important for the reproduction of these species. Reproduction of species in the families Leptodactylidae and Hylidae commonly require lentic water ecosystems where eggs are deposited, while species of the genus *Hyalinobatrachium* require vegetation over rivers and streams, where they deposit their eggs (Ramírez et al. 2009). The absence of these species could be explained by the presence of agriculture and cattle grasslands.

Most species of the family Craugastoridae were present in Station 1, where vegetation belongs primarily to sub-Andean forest. More than one third of the species reported in the country belong to this family (Acosta-Galvis 2000), due to the diversity of the genus *Pristimantis*, whose species inhabits mostly mid and high elevation habitats (Bernal and Lynch 2008). Members of the families Craugastoridae and Hemiphractidae have direct development (i. e., no larval life stage), with large



eggs and higher yolk proportion where a juvenile with similar characteristics than the adult hatches (Wells 2007). These characteristics make them highly sensitive to the conditions of humidity, which explains why all species of the genus *Pristimantis* were collected in sub-Andean forests, which is characterized by high humidity and constant fog.

Even though the Serranía is located in three different departments, our primary focus was on the amphibian species which have been reported for the department of Boyacá, since the greater extension of the Serranía is in this department. Boyacá department is home to around 108 amphibian species (Ruiz-Carranza et al. 1999, Acosta-Galvis 2000, Acosta-Galvis et al. 2006, Acosta-Galvis 2018), not counting the seven species captured during our fieldwork that could not be determined taxonomically (*Andinobates* sp., *Cryptobatrachus* sp., *Oedipina* sp., *Pristimantis* sp1., *P. sp2.*, *P. sp3.* and *Rhinella* sp.). This leads to the conclusion that 45% of the species of the department are found in the Serranía de Las Quinchas, making it an area of importance for leading amphibian conservation programs.

Order Anura

Family Aromobatidae Grant et al., 2006

### ***Rheobates palmatus* (Werner, 1899)**

Figure 2A

*Phyllobates* (*Hypodictyon*) *palmatus* Werner 1899: 479.

*Rheobates palmatus*—Grant et al. 2006: 159.

Males SVL = 25–31 mm, females SVL = 28–35 mm (Rivero and Serna 1995). Rounded snout, the upper jaw projects beyond the lower jaw; it has dermal gussets that are located on the tips of the fingers. Brown dorsum, with a short oblique lateral band and a cream or yellow granulated venter. A total of 70 individuals were found, observed mostly along streams and creeks in 4 sampling stations between 250 and 1100 m elevation. This species is distributed from the eastern slope of the northern Cordillera Central to both slopes of the Cordillera Oriental, between elevations of 350 and 2520 m (Ruiz-Carranza et al. 1996); however, we expand its range of altitudinal distribution.

Family Bufonidae Gray, 1825

### ***Rhaebo haematiticus* (Cope, 1862)**

Figure 2B

*Bufo haematiticus* Cope 1862: 157.

*Rhaebo haematiticus*—Frost et al. 2006: 365.

Males SVL = 25–31 mm, females SVL = 28–35 mm. This species is easily recognized by the lack of cranial crest, by the presence of large parotids, and having a distinct inner tarsal fold. Finger I longer than II, no webbing on any fingers; toes are joined by a webbing at the base. A total of 56 individuals were registered. All adults were found in the forest, while juveniles were found along the margin of the creeks and streams in 4 of the sampling

stations (Stations 2, 3, 4 and 5) between 250 and 1100 m. *Rhaebo haematiticus* is distributed from eastern Honduras to western Ecuador, northern Colombia and western Venezuela between 75 and 1000 m (Mueses-Cisneros 2009). In Colombia it is found in the tropical rainforests and sub-Andean forests of the lowlands of the Pacific region up to the Middle (Acosta-Galvis 2019).

### ***Rhinella humboldti* (Gallardo, 1965)**

*Bufo granulatus humboldti* Gallardo 1965:117.

*Rhinella humboldti*—Narvaes and Rodrigues 2009: 43.

Males SVL = 32.5–64.4 mm, females SVL = 37.7–70.3 mm (Narvaes and Trefaut-Rodrigues 2009). Snout rounded in lateral and dorsal views, cephalic crests usually continuous, serrated, keratinized and rugose; supratympanic crest high, rounded, rugose or granulated; parotoid gland dorsolateral, conspicuous, borders well delimited, subtriangular, vertex pointing down, wider than higher (Narvaes and Trefaut-Rodrigues 2009, Vargas-Salinas and Torres-Suárez 2014). A total of 9 individuals were found, these were observed between 250 and 400 m in open grasslands and agricultural fields, close to small ponds (Station 5). Murphy et al. (2017) report the presence of the species in the north of the Colombian Caribbean and the Magdalena Valley.

### ***Rhinella* sp. (*margaritifera* group)**

Figure 2C

*Rhinella* sp. (*margaritifera* group)—Laurenti 1768.

In this study, males SVL = 41.9–51.7, females SVL = 57.8 mm. This species is recognized by a pointed snout, dorsal surface of the head slightly concave, high postorbital crests, and canthus rostralis curved and well defined by a canthal crest. A total of 34 individuals were recorded and were observed in the leaf litter of wet pre-montane forest and in mosaics of grasslands, agricultural fields and natural vegetation; between 250 and 730 m (Stations 3, 4 and 5). Dos Santos et al. (2015) state that the species belongs to a complex of species, and is present in Panamá, Colombia, Venezuela, Ecuador, Perú, Bolivia and Brazil.

### ***Rhinella horribilis* (Wiegmann, 1833)**

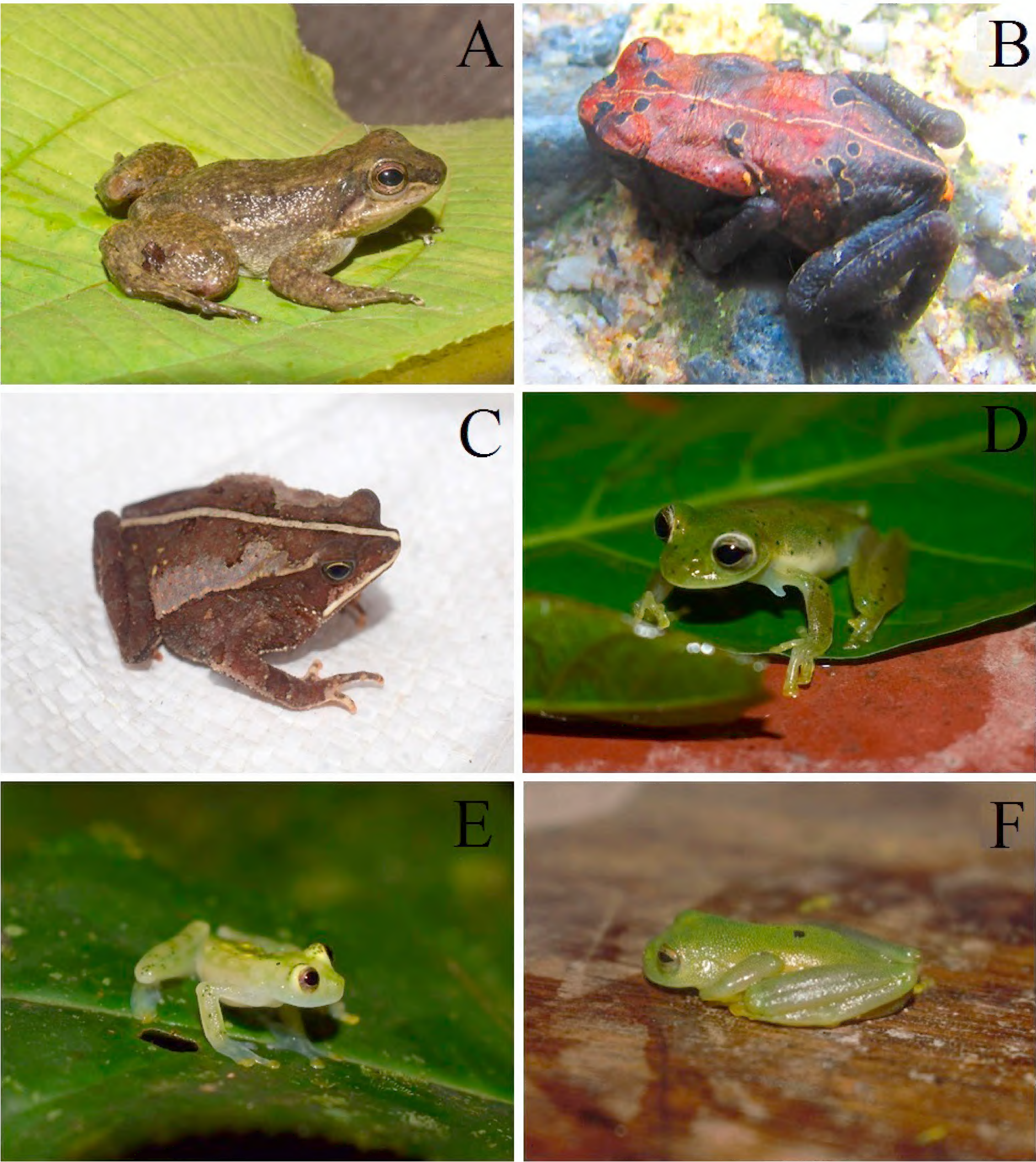
*Bufo horribilis* Wiegmann 1833: 654.

*Bufo marinus* Peters 1873: 618.

*Rhinella horribilis*—Acevedo et al. 2016: 584.

In this study, males SVL = 75.6–199 mm, females SVL = 108–150 mm. This species is characterized by the size. This is a toad of variable size between large and very large, having a large and prominent parotid gland, oval to subtriangular parotoid. Snout short, subacuminated in dorsal view, truncated to rounded in profile. Low cranial crests; canthal, preorbital, supraorbital, postorbital and supratympanic crests continuous, low and thick; less evident labial and parietal crests. Dorsally, the skin is tuberculate with medium and rounded tubers usually with a keratinized spicule at the tip. A total of 13 individuals were observed, these were found on the leaf litter or in





**Figure 2.** Amphibians of the Serranía de Las Quinchas. **A.** *Rheobates palmatus*, February 27, 2017. **B.** *Rhaebo haematiticus*, October 14, 2016. **C.** *Rhinella* gr. *margaritifera*, October 17, 2016. **D.** *Espadarana prosoblepon*, February 9, 2017. **E.** *Hyalinobatrachium fleischmanni*, February 9, 2017. **F.** *Rulyrana adiazeta*, October 20, 2016.

open areas beside water bodies present between 250 and 1450 m (Stations 1, 3, 5). This species is found from the south of Texas (USA) to the north of Peru, western and northern Colombia, west coast of Ecuador, and extreme northwestern Peru (Frost 2019). In Colombia it occupies almost all the habitats of the lowlands of the Magdalena and Cauca rivers (Acosta-Galvis 2019).

Family Centrolenidae Taylor, 1951

***Espadarana prosoblepon* (Boettger, 1892)**

Figure 2D

*Hyla prosoblepon* Boettger 1892: 4.

*Centrolene prosoblepon*—Noble 1924: 66.

*Espadarana prosoblepon*—Guayasamin et al. 2009: 33.

Males SVL = 21.2–28 mm, females SVL = 25–31 mm (Savage 2002). The head is broader than it is long, with a truncate snout. Fingers with webbing, no webbing on fingers I and II, finger I longer than II; moderate toe webbing. Venter white, transparent up to mid length of abdomen; males with a humeral spine (Suárez and Alzate-Basto 2014). Only 1 individual of the species was observed in riparian forests in station 2, calling on leaves, at 1050 m. This species is distributed Eastern Honduras



and north-central Nicaragua; Costa Rica, Panama, and Pacific slopes of Colombia and Ecuador (Frost 2019). In Colombia it is distributed in tropical humid forests, sub-Andean and Andean forests in the foothills associated with the Middle Magdalena Valley, eastern slope of the Cordillera Central and western slope of the Cordillera Oriental (Restrepo et al. 2017, Acosta-Galvis 2019).

***Hyalinobatrachium fleischmanni* (Boettger, 1893)**

Figure 2E

*Hylella fleischmanni* Boettger 1893: 251.

*Hyalinobatrachium fleischmanni*—Ruiz-Carranza and Lynch 1991: 24.

Males SVL = 19.2–25.5 mm, females SVL = 23–32 mm (Suárez and Alzate-Basto 2014). Wide head, rounded snout and anteriorly directed eyes; venter white, partially transparent, bones visible. A total of 19 individuals were found, they were observed between 1000 and 1150 m (Station 2), on leaves close to streams in riparian forests, some individuals showing parental care. It is distributed from southern Mexico to Colombia, from the western slope of the Cordillera Occidental to the western slope of the Cordillera Oriental, and along the Colombian Caribbean (Acosta-Galvis 2012b).

***Rulyrana adiazeta* (Ruíz-Carranza and Lynch, 1991)**

Figure 2F

*Cochranella adiazeta* Ruiz-Carranza and Lynch 1991: 60.

*Rulyrana adiazeta*—Guayasamin et al. 2009: 34.

SVL = 29.9 mm, undetermined sex, rounded rostrum. Finger I longer than II, without interdigital membrane, toe III longer than toe IV, covered with interdigital membrane (2); interdigital membrane on toes (Ruíz-Carranza and Lynch 1991). Only 1 individual was found, close to a stream in tropical humid forest at 890 m (Station 3). This species is endemic to the Sub Andean and Andean Forests of the Western Slope of the Cordillera Oriental (Rada and Guayasamin 2008). And this is the first record of the species in the department of Boyacá, since it was only reported previously on the mid Magdalena region, on the eastern slope of the Cordillera Central in the Cundinamarca, Santander and Tolima, at elevations between 1120 and 2060 m (Bernal and Lynch 2008). We extend its range of altitudinal distribution.

Family Craugastoridae Hedges, Duellman & Heinicke, 2008

***Craugastor metriosistus* (Ospina-Sarria, Angarita-Sierra & Pedroza-Banda, 2015)**

*Craugastor metriosistus*—Ospina-Sarria et al. 2015: 169.

Males SVL = 35.7–37.7 mm, females SVL = 52.5–60.7 mm (Ospina-Sarria et al. 2015). A medium-sized frog, differentiates itself by having an inner thigh coloration reddish brown. Prominent tympanic annulus; supratympanic fold black and well defined; finger I longer than II. A total of 76 individuals were found, most of them were observed on the leaf litter between 250 and 870 m

(Stations 3, 4 and 5). *Craugastor metriosistus* is known from the upper and middle portions of the Magdalena Valley (Frost 2019).

***Craugastor raniformis* (Boulenger, 1896)**

*Hylodes raniformis* Boulenger 1896: 19.

*Eleutherodactylus raniformis*—Stejneger 1904: 317.

*Craugastor raniformis*—Hedges et al. 2008: 37.

In this study, males SVL = 27.2–43.2 mm, females SVL = 52.2–74 mm. It is sympatric with *C. metriosistus*, having very similar morphological characters. Nonetheless, posterior surfaces of the thighs have pale markings in *C. raniformis* and there are also differences in the extension of webbing on outer side of Toe III (Ospina-Sarria et al. 2015). These two species also differ markedly in their calls (Ospina-Sarria et al. 2015). A total of 37 individuals were found, and they were recorded on the leaf litter between 250 and 870 m (Stations 3, 4 and 5). Individuals are commonly seen on the leaf litter. This species is distributed from east-central Panama to the Río San Juan de Micay in the Colombian Pacific (Frost 2019). In Colombia is distributed from the western slope of the Cordillera Occidental to the western slope of the Cordillera Oriental, in the Pacific and Caribbean region, and in the Magdalena Valley (Ospina-Sarria et al. 2015).

***Pristimantis bicolor* (Rueda-Almonacid & Lynch, 1983)**

Figure 3A

*Eleutherodactylus bicolor* Rueda-Almonacid and Lynch 1983: 2.

*Pristimantis bicolor*—Hedges et al. 2008: 114.

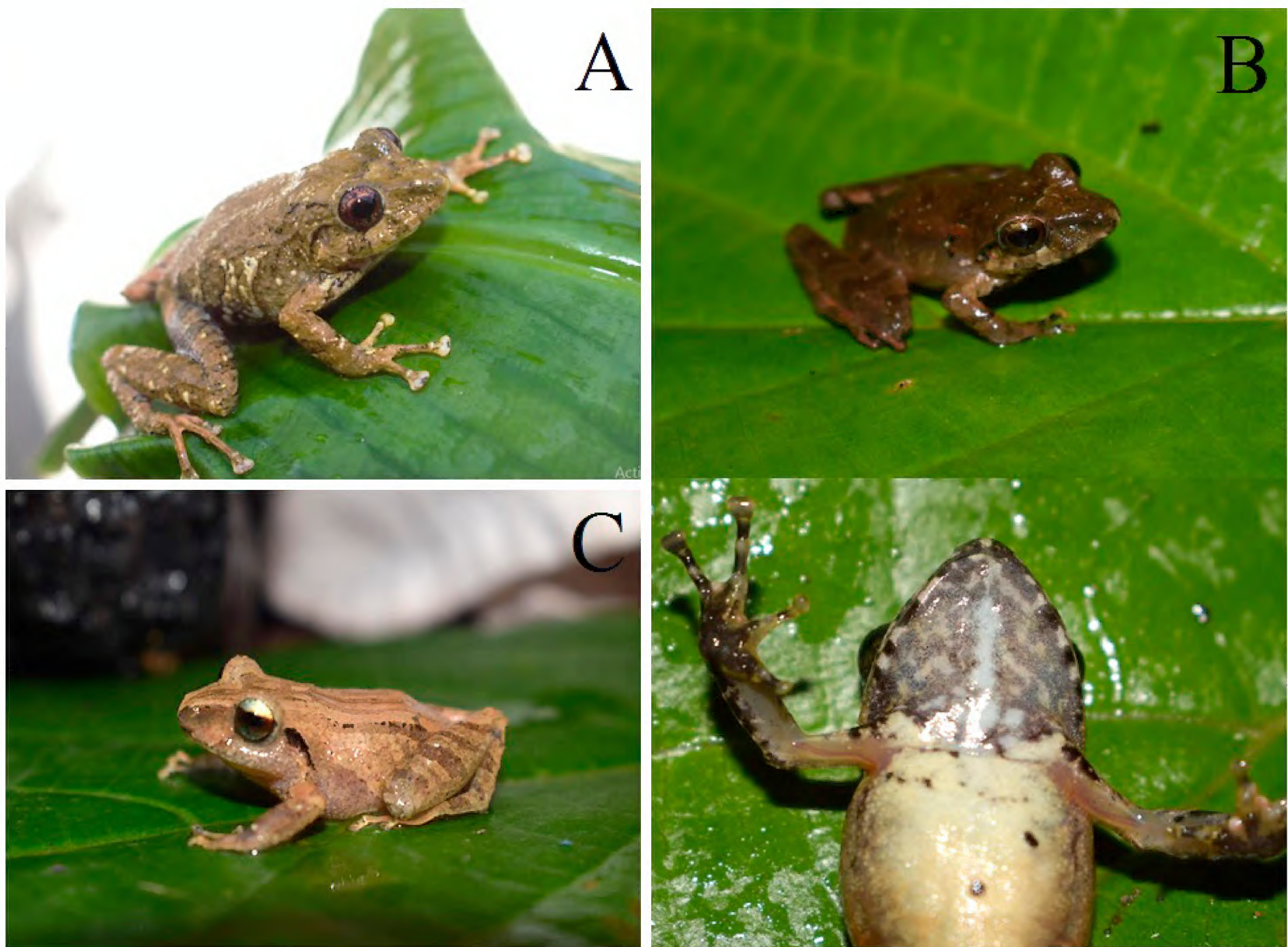
Males SVL = 24.3–29.1 mm, females SVL = 35.2–39.2 mm (Rueda-Almonacid and Lynch, 1983). This species is recognized from other *Pristimantis* species of the study site by lacking vocal sac and vocal slits in males and no dorsolateral folds. Rounded snout; conspicuous vomerine teeth, slightly oblique; supra tympanic fold darkens at the upper part of tympanum; finger II longer than I; 2 metatarsal tubercles, the internal elliptic and 4 to 5 times larger than the external one; hidden surfaces of the thighs with large cream spots (in females) or red spots (in males). A total of 111 individuals were found and were observed over leaves of bushes in the forest, between 300 and 1450 m (all stations). This is a new altitudinal record, apart from a geographic record for the Serranía de Las Quinchas, since it was reported formerly for the western slope of the Cordillera Oriental in the departments of Santander and Boyacá between 1750 and 2240 m (Suárez-Badillo and Ramírez 2004, Bernal and Lynch 2008).

***Pristimantis aff. fallax* (Lynch & Rueda-Almonacid, 1999)**

Figure 3B

Males SVL of 23.9 mm, females SVL = 25.6–27.8 mm. The species is identified as *Pristimantis aff. fallax* given the similar characters to those of this species, such as





**Figure 3.** Amphibians of the Serranía de Las Quinchas. **A.** *Pristimantis bicolor*, June 27, 2016. **B.** *Pristimantis* aff. *fallax*, February 10, 2017, and throat coloration pattern, similar to that of individuals of *P. fallax*. **C.** *Pristimantis taeniatus*, June 30, 2016.

spots on the throat and lateral reticulations (venter with no pigmentation) (Lynch and Rueda-Almonacid 1999); fifth toe longer than the third. Nonetheless, it does not have the 2 supra anal tubercles, which are an important diagnostic character of *P. fallax*. Four individuals were observed between 1200 and 1450 m (Stations 1 and 2), in sub Andean forest. It is common on leaves of plants and bushes, close to the ground.

#### ***Pristimantis gagei* (Dunn, 1931)**

*Lithodytes gagei* Dunn 1931: 387.

*Pristimantis gagei* —Hedges et al. 2008: 120.

Males SVL = 26.3–28.5 mm, females SVL = 28.1–40.2 mm (Suárez and Alzate Basto 2014). This species is recognized from other *Pristimantis* species of the study site by having Finger I longer than Finger II; fingers and toes usually lack well-defined discs; a very large tympanum. Frogs of small size; concave loreal region; adult males lack nuptial thumbs and vocal slits. The individuals collected in this study lack brightly colored dorsolateral stripes, the populations of biogeographic Chocó have a characteristic coloration pattern, with a uniformly granular back, with two yellow, orange or red dorsolateral bands extending from behind the eye at least to the middle of the body. A total of 48 individuals were found and were present in all the sampling stations. It was observed

on the floor, leaf litter and even on bare soil. *Pristimantis gagei* occurs in Costa Rica, Panamá, and the lowlands of the Sinú region and the valleys of Cauca and Magdalena rivers in Colombia, in primary and secondary forests (Suárez and Alzate Basto 2014, Frost 2019).

#### ***Pristimantis taeniatus* (Boulenger, 1912)**

Figure 3C

*Eleutherodactylus taeniatus* Boulenger 1912: 188.

*Pristimantis taeniatus* —Hedges et al. 2008: 121.

In this study, males SVL = 17.8–25.1, females SVL = 22.3–28.6. Rounded snout; well-developed discs and dermal scutes on fingers and toes; finger II longer than Finger I; skin of the dorsum is finely granular; black supratympanic fold; cream venter; color pattern of horizontal bars on the hindlimbs (Lynch and Ardila-Robayo 1999). A total of 48 individuals were found and were recorded in only 3 stations between 900 and 1300 m (Stations 1, 2 and 3). Individuals are commonly found on leaves of plants. It is distributed from Panamá to the western slope of the Cordillera Oriental in Colombia, under elevations lower than 1400 m (Frost 2019).

#### ***Pristimantis viejas* Lynch & Rueda-Almonacid, 1999**

Figure 4A

*Eleutherodactylus viejas* Lynch and Rueda-Almonacid 1999: 311.

*Pristimantis viejas* —Hedges et al. 2008: 121.





**Figure 4.** Amphibians of the Serranía de Las Quinchas. **A.** *Pristimantis viejas*, February 12, 2017. **B.** *Pristimantis* sp. 1, June 29, 2016. **C.** *Pristimantis* sp2, February 13, 2017. **D.** *Pristimantis* sp. 3, February 13, 2017.

Males SVL = 15.3–19.1 mm, females 24.0–29.1 mm (Lynch and Rueda-Almonacid 1999). Rounded snout; males have vocal slits, nuptial pads and tubercles on the external edge of the tarsus; Finger II longer than Finger I; posterior surfaces of the thigh dark brown with orange spots. Two individuals were observed during the study in sub Andean and riparian forest, on leaves of plants and bushes, close to the ground. This is the first record of the species in the department of Boyacá, since it was only reported previously in the mid Magdalena region, on the eastern slope of the Cordillera Central in the departments of Antioquia and Caldas, and on the western slope of the Cordillera Oriental in the departments of Cundinamarca and Santander, at elevations between 600 and 1800 m (Lynch and Rueda-Almonacid 1999).

#### ***Pristimantis* sp. 1**

Figure 4B

One female SVL of 24.6 mm was collected; it had a truncated rostrum, white granulated venter and a pattern of bars dorsally on all limbs; tympanum smaller than that of *Pristimantis* sp. 2 and *P. aff fallax*. There is no coloration on the throat. It has less tubercles on the base of the hindlimbs than *P. aff fallax* and lacks lateral folds. The only individual observed was in the sub Andean forest.

#### ***Pristimantis* sp. 2**

Figure 4C

SVL 31.40 mm. It has the same throat coloration as *P. fallax*, but has no lateral folds, and lacks the 2 supra-anal tubercles. It also differs from *P. fallax* by having folds on the lateral zone of the hind limbs and having no barring pattern on the thighs. Only 1 individual was observed in the sub Andean forest.

#### ***Pristimantis* sp. 3**

Figure 4D

Males SVL = 16.6–21.4 mm, females SVL = 27.3–29.5 mm. It resembles morphologically to *P. taeniatus* but has 2 black tubercles in the lumbar zone, and a tympanum significantly larger than that of *P. taeniatus*. This morphotype was observed in sub-Andean, riparian and pre-Montane humid forests.

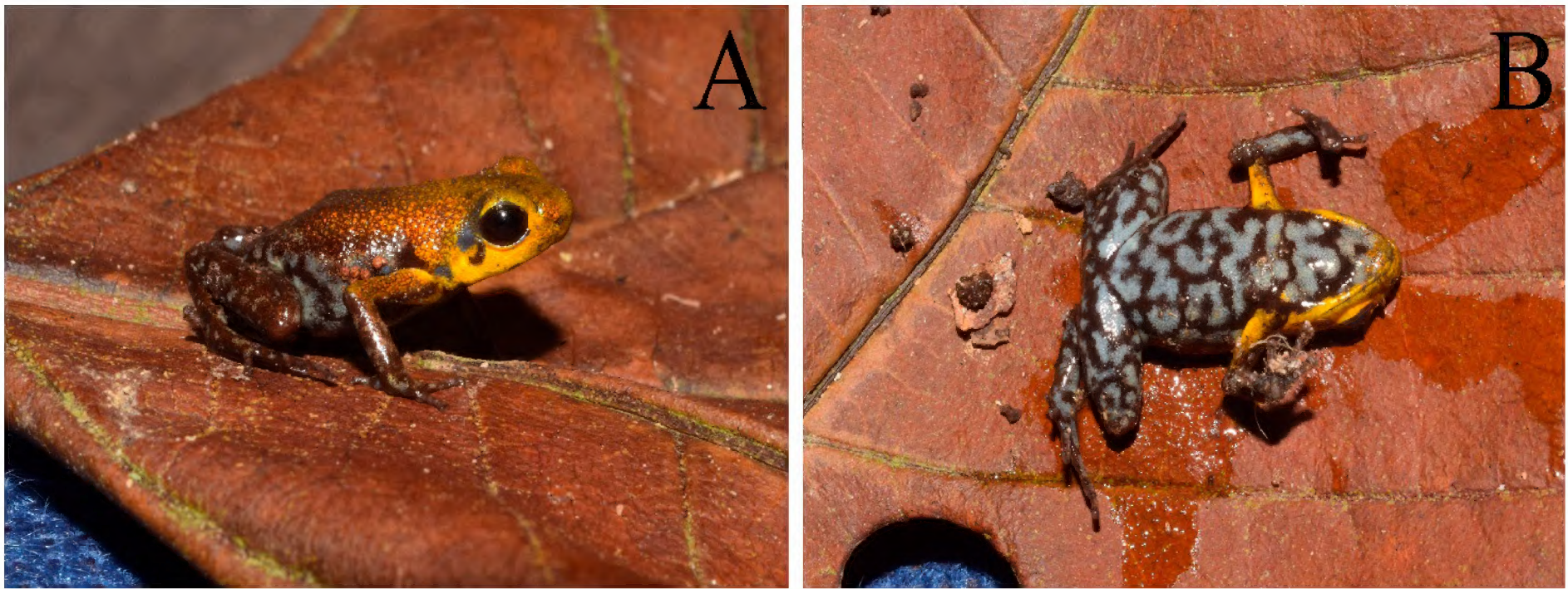
Family Dendrobatidae Cope, 1865

#### ***Andinobates* sp.**

Figure 5A, B

SVL = 15.2–17.4 mm. Adults have a yellow dorsum, while it is dark orange in juveniles. It differs from *A. virolinensis* in the dorsal coloration and the white ventral spots present in *Andinobates* sp. It differs from *A. tolimensis*





**Figure 5.** Amphibians of the Serranía de Las Quinchas. **A.** *Andinobates* sp., March 3, 2017. **B.** Photograph of ventral coloration pattern.

(from the Cordillera Central) in the ventral coloration, although the spots on the ventral area of the thighs are similar in both species. The coloration of *A. tolimensis* is a lighter yellow on the dorsum with a dark stripe extends from the eyes to the arm insertion, whereas the individuals collected lack the stripe dark from the eye.

Nine individuals were found in the higher-altitude stations, in sub-Andean and humid pre-montane forests between 800 and 1400 m (Stations 1 and 3).

#### ***Colostethus inguinalis* (Cope, 1868)**

*Prostherapis inguinalis* Cope 1868: 137.

*Colostethus inguinalis*—Savage 1968: 745.

In this study, males SVL = 27 mm, and females SVL = 30 mm. Adult males with solid black throat, black pigmentation extending posterior onto chest and anterior belly (Grant 2004); males with Finger III swollen; toes moderately webbed; oblique lateral pale line extending halfway from groin to the eye (Grant 2004). One single individual was observed by Quebrada La Fiebre in relicts of humid tropical forest at 300 m. *Colostethus inguinalis* is known from lowland forests of northern Pacific region, mid Magdalena river valley, and northern foothills of the western slope of the western Cordillera Occidental.

#### ***Dendrobates truncatus* (Cope, 1861)**

*Phyllobates truncatus* Cope 1861: 372.

*Dendrobates truncatus*—Cope 1867: 197.

In this study, Males SVL = 22.4–26.5 mm, and females SVL = 25.8–29.7 mm. The dorsum is black with 2 dorsolateral lines that can vary from yellow, golden yellow, greenish yellow to almost blue; belly is black with irregular blue spots; smooth skin, except on the legs (Suárez and Alzate Basto 2014). A total of 34 individuals were found and were observed between 250 and 1000 m (Stations 3, 4 and 5). They are commonly seen on the forest floor and the leaf litter. It is endemic to Colombia, between 100 and 1800 m, principally along the Magdalena river valley (Acosta-Galvis et al. 2006), from Chaparral to the Colombian Caribbean, and the lowlands on



**Figure 6.** *Hyloxalus vergeli*, October 13, 2016.

the northern edge of the Cordillera Central and Cordillera Occidental, up to the Urabá gulf.

#### ***Hyloxalus vergeli* Hellmich, 1940**

Figure 6

*Hyloxalus vergeli* Hellmich 1940: 122.

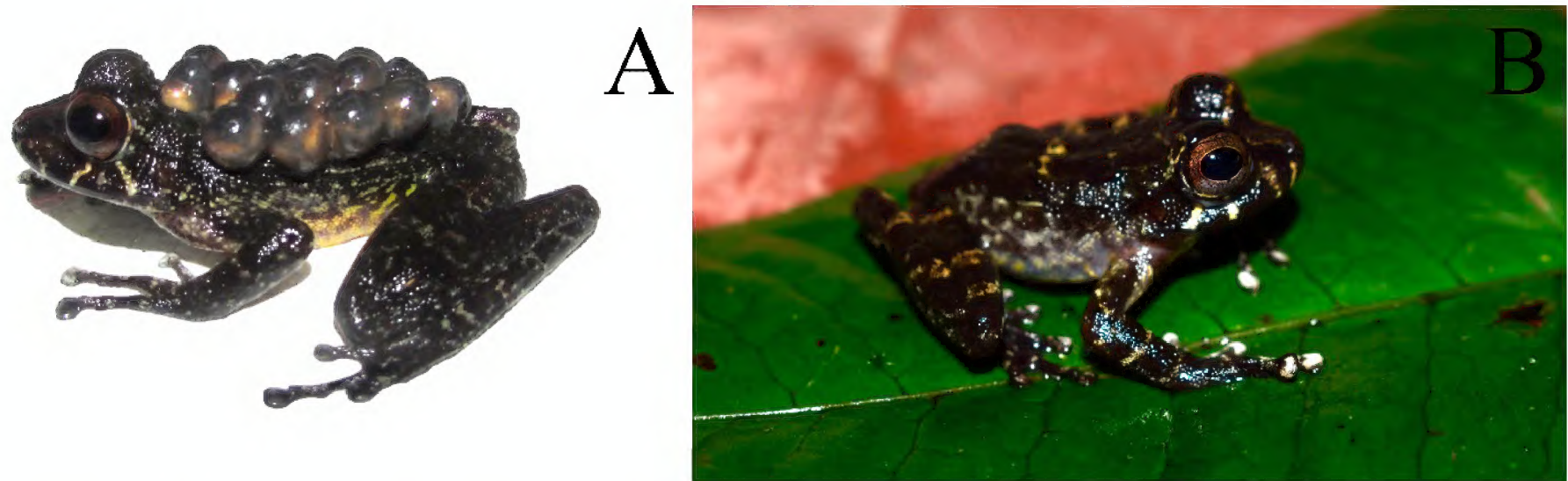
*Colostethus vergeli*—Edwards 1971: 148.

*Hyloxalus vergeli*—Grant et al. 2006.

In this study, males SVL = 22.9–28.2, females SVL = 24.9–30.5 mm. Head as wide as the body, relatively small eyes; 2 dermal scutes on the distal end of the fingers; toes with basal webbing; dorsum dark or light brown, light dorsolateral line and brown or gray venter in males, cream with brown marbling in females. A total of 28 individuals were found, only observed in riparian forest (Stations 2 and 3). This is the first record for the species in Boyacá department, while it was formerly reported in the departments of Cundinamarca, Huila and Tolima, on the eastern slope of the Cordillera Central, and the western slope of the Cordillera Oriental along the Magdalena River inter-Andean Valley (Acosta-Galvis 2019).

Family Hemiphractidae Peters, 1862





**Figure 7.** Amphibians of the Serranía de Las Quinchas. **A.** Female of *Cryptobatrachus* sp., February 17, 2017. **B.** Male, June 28, 2016.

***Cryptobatrachus* sp.**

Figure 7A, B

In this study, males SVL = 35.5–43.4 mm, females SVL = 60.2–64.5 mm. Dorsum black with cream spots, venter white; dorsolateral discontinuous folds. Individuals captured have a larger tympanum and differ in size from *C. fuhrmanni*; the latter has triangular vomerine teeth (Lynch 2008), while in the individuals recorded in this study, they are straight-horizontal. A total of 26 individuals were observed, and were found only in the Station 3, in riparian forest at 1000 m.

Family Hylidae Rafinesque, 1815

***Boana boans* (Linnaeus, 1758)**

*Rana boans* Linnaeus 1758: 213.

*Hypsiboas boans*—Faivovich et al. 2005: 89.

*Boana boans*—Dubois 2017: 28

In this study, males SVL = 86.5–87.1 mm, females SVL = 90–90.52 mm. It is a tree frog of large size; rhomboid pupils and pigmentation in the palpebral membrane; webbing on fingers and toes, males have a prepolic spine; by day the dorsal color is generally paler than at night; lateral surfaces of the back are grayish bronze with vertical dark brown lines; posterior surfaces of the thighs are brown to gray with vertical lines of pale brown. A total of 30 individuals were found and were observed over leaves of trees close to water bodies in Station 5, in cultivated fields, grasses with relicts of wet forests at elevations between 290–350 m. *Boana boans* occurs in the lower Amazon Basin, upper Orinoco and Magdalena Basins, Guianas, Colombia and Ecuador in South America; eastern Panama; Trinidad (Frost 2019). In Colombia, it is distributed in the Magdalena river valley, North of Antioquia department, the pacific coast, the eastern savannas and the amazon, between 0 and 1200 m (Acosta-Galvis 2019, Suárez and Alzate Basto 2014).

***Boana pugnax* (Schmidt, 1857)**

*Hyla pugnax* Schmidt, 1857: 11.

*Hypsiboas pugnax*—Cope 1867: 148.

*Boana pugnax*—Dubois 2017: 28

One female was recorded with SVL = 73.3 mm. It is a tree frog of large size; pupils bluish, pigmentation in the anterior half of palpebral membrane, dorsum is light brown with some darker brown markings; hindlimbs with vertical dark brown bars; darker and thicker bars on the pleural region. This species was recorded in the Station 5, on tree branches on the edge of ponds. It is distributed from eastern Panamá to Venezuela, and in Colombia, it is distributed in the Caribbean, the Cauca and Magdalena river valleys, and the eastern savannas, from sea level up to 500 m (Acosta-Galvis 2012a).

***Boana xerophylla* (Duméril & Bibron, 1841)**

*Hyla xerophylla* Duméril and Bibron 1841: 122.

*Hypsiboas xerophylla*—Orrico 2017: 148.

*Boana xerophylla*—Dubois 2017: 28

Males SVL = 46.4–57.3 mm, females SVL = 54.1–65.1 mm (Lynch and Suárez-Mayorga, 2001). It is a tree frog of large and moderate size; dorsum light brown with granular skin on the throat, ventral surface has an orangish tint, the throat and chest white with some brown flecking; small tubercles present on dorsum and head. A total of 14 individuals were recorded, and were observed in the stations 1, 2 and 3, in water bodies like fish breeding ponds, in agricultural areas and grasslands with humid forest relicts between 300 and 900 m. This species can be confused with *B. boans* and *B. pugnax* due to the similarity in body size and coloration. It can be differentiated from these 2 species by its horizontal pupil and its iris that is pale gray at the center and greenish yellow at the edges, in contrast to a rhomboid pupil with an iris that is black at the center and orange at the edges in *B. boans*, and a horizontal pupil with an iris that is black at the center in *B. pugnax* (Restrepo et al. 2017). The species is distributed from east Panamá to the Guianas, at elevations between 0 and 2400 m, and in Colombia, it is reported in the Caribbean, the Cauca and Magdalena river valley, and in the upper Amazon basin (Orrico et al. 2017).

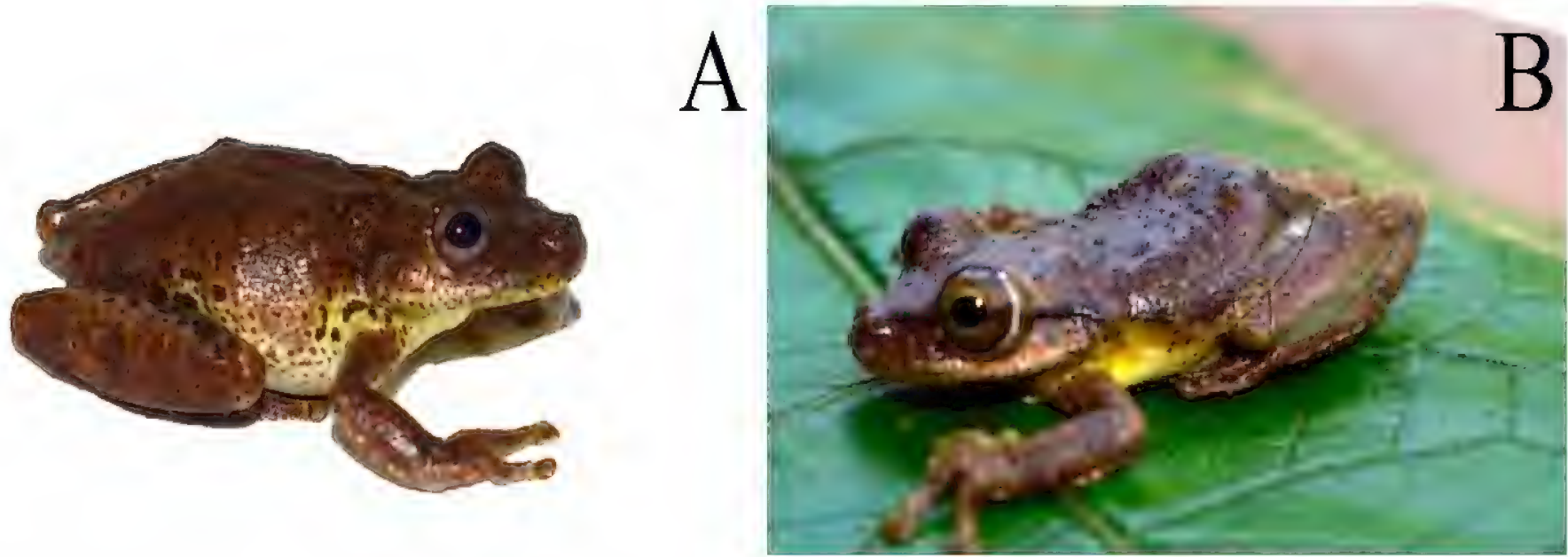
***Dendropsophus microcephalus* (Cope, 1886)**

*Hyla microcephala* Cope 1886: 281.

*Dendropsophus microcephalus*—Faivovich et al. 2005: 92.

In this study, males SVL = 19.4–57.3 mm, females SVL





**Figure 8.** Amphibians of the Serranía de Las Quinchas. **A.** Female of *Scinax caprarius*, June 30, 2016. **B.** Male, October 11, 2017.

= 54.1–65.1 mm. Color of dorsum yellow and brown, and red or purple markings; a thin brown lateral line from the nostril to the sacrum or groin, bordered by a thin white line. A total of 19 individuals were recorded, and were observed only in the Station 5, between 250 and 350 m, on leaves of vegetation close to water bodies. It is distributed from Southern Mexico to Brazil. In Colombia, it is present in the Magdalena river valley, and savannas of the north of the Orinoco below 1200 m (Suárez and Alzate Basto 2014).

#### ***Hyloscirtus palmeri* (Boulenger, 1908)**

*Hyla palmeri* Boulenger 1908: 515.

*Hyloscirtus palmeri*—Faivovich et al. 2005: 92

In this study, males SVL = 36–42 mm, females SVL = 45–48.3 mm. Round or truncated rostrum; tympanum is present but not evident; it has white folds with brown flanges on the upper arms, legs and above the cloaca; dorsum green, venter white. A total of 14 individuals were found, and were observed on branches along streams in relicts of humid and riparian forests, in the stations 2, 3, 4 and 5, between 300 and 1000 m. The species is not present above 1600 meters and is distributed from Costa Rica to Ecuador. It is present in the biogeographic Chocó region, in the departments of Chocó, Valle del Cauca, Nariño and Antioquia, and the departments of Caldas, Santander (Rivera-Correa and Faivovich 2014).

#### ***Scinax caprarius* Acosta-Galvis, 2018**

Figure 8A, B

*Scinax caprarius* Acosta-Galvis 2018: 19.

Males SVL = 31.6–35.7 mm, females SVL = 40.6–41.5 mm. This species has green bones, rostrum truncated. Fingers short, thin and moderately expanded; discs on fingers elliptic. Reddish brown back, Inner thighs yellow with black dots, yellow fingers, webbing present in feet and absent in hands. It was present in the stations 1, 2 and 3, between 900 and 1300 m, close to water bodies in sub-Andean and humid pre-Montane forests. The species is distributed in the sub Andean forest, between 935 and 1035 m elevation (Acosta-Galvis 2018). Here, we expand its range of altitudinal distribution.

#### ***Scinax rostratus* (Peters, 1863)**

*Hyla rostrata* Peters 1863: 466.

*Scinax rostratus*—Köhler and Böhme 1996: 139.

In this study, males SVL = 39.2–40.3 mm, females SVL = 48.1–52.7 mm. The most conspicuous characteristic of the species is a brown triangular marking between the eyes of most individuals; yellow or orange posterior surfaces of the thighs, with prominent vertical brown or black bars (Duellman 2001). A total of 6 individuals were observed between 260 and 300 m, on leaves of vegetation in water bodies and grasslands close to wet forest relicts, in Station 5. The species is distributed from Panamá to Guyana and Surinam, and in Colombia, it is present in the inter-Andean valleys, the Chocó biogeographic zone and along the savannas in the north, up to the Sierra Nevada de Santa Marta (Acosta-Galvis 2019, Suárez and Alzate Basto 2014).

#### ***Scinax ruber* (Laurenti, 1768)**

*Hyla rubra* Laurenti 1768: 35.

*Scinax ruber*—Kölher and Böhme 1996: 139.

In this study, males SVL = 29.1–31.7 mm, females SVL = 33.1–40.4 mm. The species is identified by a snout rounded in dorsal view, absent membranes between the fingers of the hands and the toes have membranes along three-fourths of their length except between fingers I and II, where they are rudimentary; the skin on the back is smooth and the skin on the belly is granular (Duellman 1978). Dorsum is brown or pale matt yellow, the belly varies between cream and creamy yellow, and the vocal sac is yellow. A total of 7 individuals were observed between 250 and 380 m, on leaves of vegetation in water bodies and grasslands close to wet forest relicts, in Station 5. The species is distributed from Panamá to Brazil, and in Colombia, it is present in the inter-Andean valleys, the Chocó biogeographic zone, Caribbean region and the Amazon (Suárez and Alzate Basto 2014, Acosta-Galvis 2019).

Family Phyllomedusidae (Günther 1858)

#### ***Phyllomedusa venusta* Duellman & Trueb, 1967**

*Phyllomedusa venusta* Duellman and Trueb 1967: 128.



In this study, males SVL = 80–87.9 mm, females 86.3–97.7 mm. A tree frog of medium size; vertical pupil; creamy venter with pink spots; Finger I is longer than Finger II. This species was recorded in Station 3, at 900 m, calling on a branch over a pond. Only found on the lowlands of northern Colombia and the Magdalena river valley, up to 1400 m elevation, with some records from the Darién region (Acosta-Galvis et al. 2006).

Family Leptodactylidae (Werner 1896, 1838)

***Engystomops pustulosus* (Cope, 1864)**

*Paludicola pustulosa* Cope 1864: 180.

*Engystomops pustulosus*—Boulenger 1882: 276.

In this study, males SVL = 23.9–28.8 mm, females SVL = 31.6–34.8 mm. Small toad, bulky body, slender extremities; short head; small mouth; no teeth are present on the maxilla and premaxilla; small parotid glands; tuberculate tympanic membrane; fingers are long and thin, finger I is longer than finger II; dorsal region is brown, grayish, with darker spots, the gular region, the chest and the anterior part of the belly are grayish, with a yellowish line, the belly is slightly granular, white. A total of 29 individuals were recorded, and were observed in the stations 3, 4 and 5, between 250 and 800 m, on the leaf litter and on bare soil. It has a wide distribution, from southeast Mexico (Lee 1996) to Venezuela (Gorzula and Señaris 1999 “1998”), and in the lowlands of the Caribbean, Magdalena river valley and north Orinoco basin in Colombia (Acosta-Galvis 2012a, Pedroza-Banda et al. 2014).

***Leptodactylus colombiensis* Heyer, 1994**

*Leptodactylus colombiensis* Heyer 1994: 82.

Only 1 individual with an SVL = 80 mm was reported. It was a medium sized male; lacked chest spines. This species is characterized by the presence of indistinct, short, or moderate-length dorsolateral folds; tympanum large. Sides of fingers weakly ridged, each thumb with 2 medial black spines, distal spine broad, moderately large, proximal spine smaller, medium sized (Heyer 1994). Dorsum olive green, with small to medium black spots and foot

cream colored; venter cream with tan dots or reticulations. Iris golden with dense brown dots. The species is found in the inter Andean valleys, but not in the Cauca river valley, and in the piedmont of the eastern savannas (Angarita-Sierra 2014, Suárez and Alzate-Basto 2014, Restrepo et al. 2017).

***Leptodactylus fragilis* (Brocchi, 1877)**

*Cystignathus fragilis* Brocchi 1877: 182.

*Leptodactylus fragilis*—Fouquette and Dubois 2014: 376.

Only 1 individual with an SVL = 33.2. It has a triangular spot that begins on the nose and ends between the eyes; with discontinuous rows of small, white warts on the flanks. One single individual was found in the Station 5, near a stream in grass and agriculture fields at 300 m. The species is widely distributed, from Mexico to Venezuela, and the inter-Andean valleys, the Caribbean and the Orinoco basin in Colombia (Frost 2019).

***Leptodactylus savagei* Heyer, 2005**

*Leptodactylus savagei* Heyer 2005: 330.

One male with SVL = 134.4 mm, with brown dorsum; light upper lip stripe absent; gray venter; dorsal folds absent; weak dorsolateral folds; red spots in the inner surface of the thighs; upper shank barred. It was recorded in open grasslands at 260 m elevation. The species is present from Honduras to northern Colombia including Caribbean region and Magdalena valleys (Suárez and Alzate-Basto 2014).

Family Ranidae (Batsch, 1796)

***Lithobates vaillanti* (Brocchi, 1877)**

*Rana vaillanti* Brocchi 1877: 175.

*Lithobates vaillanti*—Dubois 2007: 829.

One male with SVL = 66.1 mm was observed. Terrestrial frog of large size; green dorsum; large and conspicuous tympanum; dorsolateral fold in both flanks between the upper eyelid and the groin; webbing on all toes. It was found in Station 5, in a stream of a tropical wet forest relict at 250 m elevation. The species is distributed from

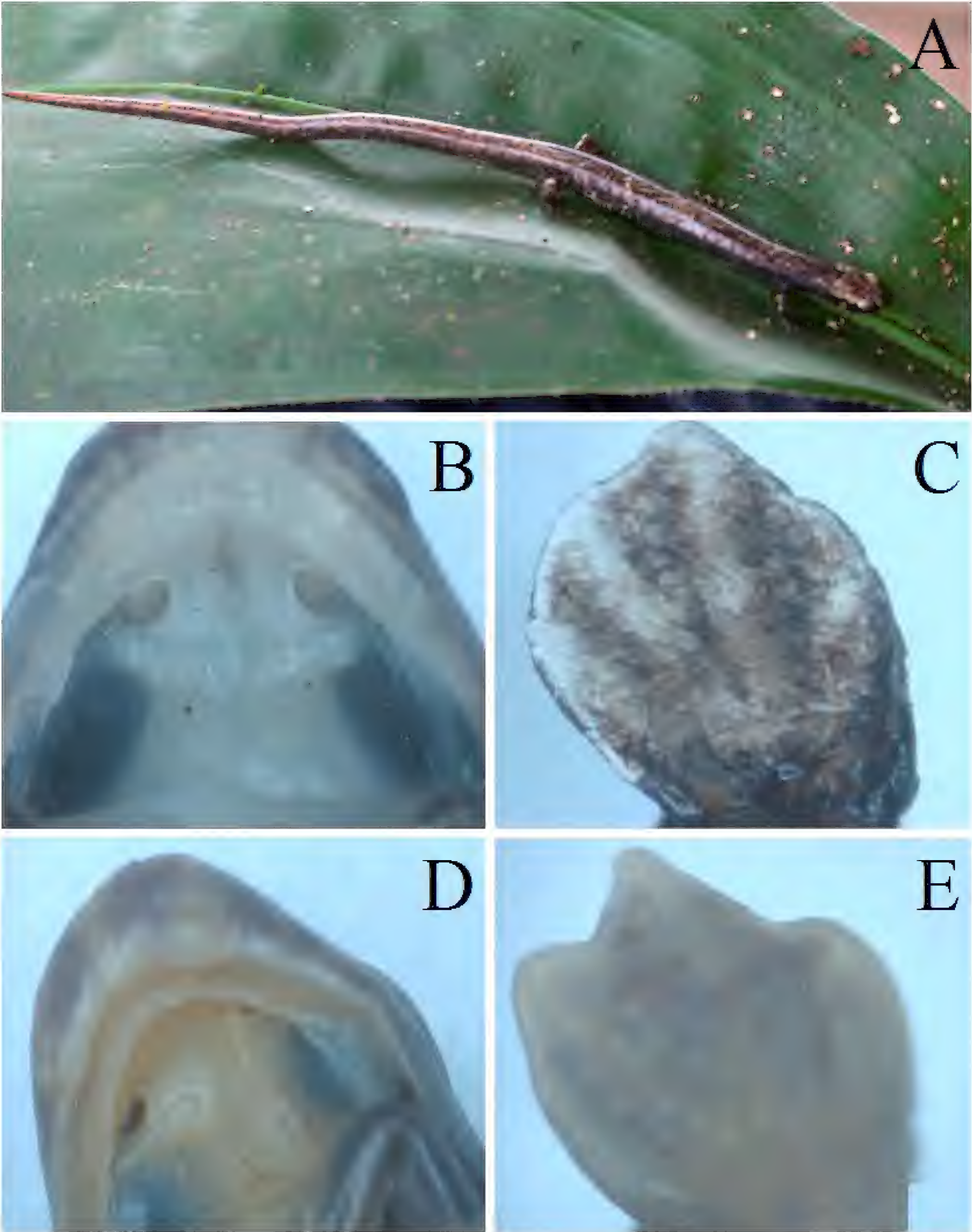


**Figure 9.** *Bolitoglossa lozanoi*, June 28, 2016.



the lowlands of Mexico to Ecuador. It can be found in the Colombian lowlands of the pacific coast, Cordillera Occidental and Cordillera Central piedmonts, and the Magdalena river valley between 0 and 1700 m elevation (Acosta-Galvis 1999).

Family Plethodontidae (Gray, 1850)  
*Bolitoglossa lozanoi* Acosta-Galvis & Restrepo, 2001  
Figure 9  
*Bolitoglossa lozanoi* Acosta-Galvis and Restrepo 2001: 462.



**Figure 10.** Amphibians of the Serranía de Las Quinchas. **A.** *Oedipina* sp. June 23, 2016. **B.** Vomerine teeth of *Oedipina* sp. **C.** Webbing of feet in *Oedipina* sp. **D.** vomerine teeth of *Oedipina parvipes* (ICN53644), locality. Western Cordillera, Chocó department. **E.** Webbing of feet in *O. parvipes* (ICN53644).



Males SVL = 49.5–57.9 mm, females SVL = 54.2–59.2 mm (Acosta-Galvis and Restrepo 2001). The head is as wide as the body; moderately sized protuberances of the nasolabial grooves, prominent in ventral view; extensive interdigital membrane manual and toes; dorsal surface coffee colored, with small brown to black spots; belly coffee colored, with a brownish ventral chromatic pattern, with small darker brown and cream dots (Acosta-Galvis and Restrepo 2001). A total of 2 individuals were recorded in Station 2, on large leaves of plants in riparian forests between 1000 and 1100 m. The species is endemic to the tropical humid forests of the Andean foothills associated with the middle valley of the Magdalena and south western foothills of the Serranía del Perijá (Acosta-Galvis 2004, Acosta-Galvis and Gutiérrez-Lamus 2012).

### *Oedipina* sp.

Figure 10A

One individual with SVL = 39.9 mm, and total length of 92.4 mm. It has 14 vomerine teeth, 16 costal grooves, tail longer than rostrum-cloacal distance, and short and thin limbs. It was observed in Station 5, on the humid leaf litter in wet tropical forest vegetation, at 450 m elevation. This is the first record for the genus *Oedipina* in the Eastern Cordillera, since *Oedipina complex* and *O. parvipes* are distributed in the Cordillera Occidental and Cordillera Central. The individual collected shows significant differences in diagnostic characters such as vomerine teeth (Fig. 9B, C), costal grooves and palm shape (Fig. 9D, E), due to which we suggest that it could be a new species.

## Acknowledgements

We acknowledge Professor John D. Lynch for his help and for access to the collection of the Instituto de Ciencias Naturales, as well as Marvin Anganoy, Marco Rada, Gustavo González and Leonardo Niño, who gave valuable insights into the taxonomic identification of some species. This work had financial support from the Chicago Zoological Society and the group “Investigación Manejo Integrado de Ecosistemas y Biodiversidad (XIUA)” of the Universidad Pedagógica y Tecnológica de Colombia, in the project “Condition of *Atelopus* sp. in Parque Serranía de las Quinchas Natural Regional (Boyacá – Colombia)”. We thank Victor Fajardo and Harrison Galvis from the local community, who collaborated as field guides, and would like to thank Alcibiades Escárraga and Felipe Castillo, who participated in the sampling.

## Authors' Contributions

AOP, CCR and SA conceived the idea and wrote the text. AOP and SA confirmed the taxonomic identity of all specimens.

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Appendix

**Table A1.** List table of species reported and collected for the Serranía de Las Quinchas in the municipalities of Otanche and Puerto Boyacá (Boyacá), and Yacopí (Cundinamarca). \* New records of species for the Serranía de Las Quinchas.

Taxon		IUCN (2018)	This study (stations)	Altitudinal records for Las Quinchas	Reference	Reference material
Anura Order						
Aromobatidae						
1	<i>Allobates niputidea</i> (Grant Acosta & Rada, 2007)	LC		70–320	Acosta-Galvis et al. (2006), Grant et al. (2007)	<b>Puerto Boyacá:</b> ICN 47969-70
2	<i>Rheobates palmatus</i> (Werner, 1899)	LC	2, 3, 4, 5	250–1250		<b>Otanche:</b> ALOP-252, 284. <b>Puerto Boyacá:</b> ALOP-018, 099. <b>Yacopí:</b> UIS-MHN-A-0565-66
Bufonidae						
3	<i>Rhaebo haematiticus</i> (Cope, 1862)	LC	2, 3 ,4, 5	300–1200	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-172. <b>Puerto Boyacá:</b> ICN-38537-40, 45332-41; IAvH-4023, 9023-9026; MPUJ 1146-50; ALOP-066
4	<i>Rhinella humboldti</i> (Spix, 1824)	LC	5	300–400	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN-38512-13, 44595-99, 45212-18; MPUJ 991-92; ALOP-176-77.
5	<i>Rhinella horribilis</i> (Wiegmann, 1833)	LC	1, 3, 5	260–1400	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> MPUJ 858-59; ALOP-005
6	<i>Rhinella</i> sp. ( <i>margaritifera</i> group)	LC	3, 4, 5	320–900	Acosta-Galvis (2017), Acosta-Galvis et al. (2006)	<b>Otanche:</b> IAvH 7758-59; ALOP-230. <b>Puerto Boyacá:</b> IAvH 8950; ALOP-065. <b>Yacopí:</b> UIS-MHN 0496-98
Centrolenidae						
7	<i>Espadarana prosoblepon</i> (Boettger, 1892)	LC	2	1050–1150	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-258
8	<i>Hyalinobatrachium colymbiphyllum</i> (Taylor, 1949)	LC		305–360	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN-45363-80
9	<i>Hyalinobatrachium fleischmanni</i> (Boettger, 1893)	LC	2	360–1100	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-213,219-223. <b>Puerto Boyacá:</b> ICN-45262-64
10	<i>Hyalinobatrachium valerioi</i> (Dunn, 1931)	LC		360	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN-45327,45330
11	<i>Rulyrana adiazeta</i> *(Ruíz-Carranza, & Lynch 1991)	VU	3	890		<b>Otanche:</b> ALOP-235
Craugastoridae						
12	<i>Craugastor metriosistus</i> (Ospina-Sarria, Angarita-Sierra & Pedroza-Banda, 2015)	NE	3, 4, 5	260–720	Ospina-Sarria et al. (2015)	<b>Otanche:</b> ALOP-236. <b>Puerto Boyacá:</b> ICN-38614, 38617, 38633, 3863536, 38651–52, 38655, 44565–67, 44721–22; ALOP-003,071-72
13	<i>Craugartor raniformis</i> (Boulenger, 1896)	LC	3, 4,, 5	250–900	Acosta-Galvis et al. (2006), Ospina-Sarria et al. (2015)	<b>Otanche:</b> ALOP-238,250-51. <b>Puerto Boyacá:</b> ICN 38576–79, 38582, 38586–38602, 38605–13, 45419–20, 45422, 45424; MPUJ 861; ALOP-001,0-24-25
14	<i>Pristimantis bicolor</i> * (Rueda, & Lynch 1983)	VU	1, 2, 3, 4, 5	300–1400*		<b>Otanche:</b> ALOP-092-95,280. <b>Puerto Boyacá:</b> ALOP-019, 059
15	<i>Pristimantis gagei</i> (Dunn, 1931)	LC	1, 2, 3, 4, 5	300–1450	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-232, 266. <b>Puerto Boyacá:</b> ALOP-040,070
16	<i>Pristimantis</i> aff. <i>fallax</i>	–	1, 2	1100–1450		<b>Otanche:</b> ALOP-115,259-260
17	<i>Pristimantis taeniatus</i> (Boulenger, 1912)	LC	1, 2, 3	780–1450	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-123, 268-69, 288. <b>Puerto Boyacá:</b> ICN 47955
18	<i>Pristimantis viejas</i> * (Lynch & Rueda, 1999)	LC	1, 2	1100–1250		<b>Otanche:</b> ALOP-079, 263
19	<i>Pristimantis</i> sp. 1	–	1, 2	1100–1450		<b>Otanche:</b> ALOP-082,113
20	<i>Pristimantis</i> sp. 2	–	1, 2	1300–1450		<b>Otanche:</b> ALOP-122, 265
21	<i>Pristimantis</i> sp. 3	–	1	900–1300		<b>Otanche:</b> ALOP-122, 274-76
Dendrobatidae						
22	<i>Andinobates</i> sp.*	–	1, 3	850–1450		<b>Otanche:</b> ALOP-181-182, 278-79
23	<i>Colostethus inguinalis</i> (Cope, 1868)	LC	5	300	Acosta-Galvis et al. (2006), Grant (2004)	<b>Puerto Boyacá:</b> ICN 47962–47968; ALOP-017
24	<i>Dendrobates truncatus</i> (Cope, 1861)	LC	3, 4, 5	250–970	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-178. <b>Puerto Boyacá:</b> IAvH 9140, ALOP-014-15. <b>Yacopí:</b> UIS-MHN-A-0492-93
25	<i>Hyloxalus vergeli</i> * (Hellmich, 1940)	VU	2, 3	900–1100		<b>Otanche:</b> ALOP-191-197,278-79



Taxon		IUCN (2018)	This study (stations)	Altitudinal records for Las Quinchas	Reference	Reference material
<b>Hemiphractydae</b>						
26	<i>Cryptobatrachus fuhrmanni</i> (Peracca, 1914)	VU		500		<b>Puerto Boyacá:</b> IAvH 9149-52. <b>Yacopí:</b> ICN 42923-24
27	<i>Cryptobatrachus</i> sp.	–	2	1000		<b>Otanche:</b> ALOP-076,101-104
<b>Hylidae</b>						
28	<i>Boana boans</i> (Linnaeus, 1758)	LC	5	250–400	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN 44555; ALOP-145,270-71
29	<i>Boana pugnax</i> (Schmidt, 1857)	LC	5	250–400	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN 35805-06;38063-64;45442-43, 45448;45453,45455-50,52993; ALOP-144
30	<i>Boana xerophylla</i> (Duméril & Bibron, 1841)	LC	3, 5	300–900	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-198-204. <b>Puerto Boyacá:</b> ICN 45439-40, 45445-47, 45449-51; MPUJ 955,964-66; ALOP-013
31	<i>Dendropsophus ebraccatus</i> (Cope, 1874)	LC		300	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN 45198-99, 45200-04. <b>Yacopí:</b> UIS-MHN-A-0524
32	<i>Dendropsophus microcephalus</i> (Cope, 1886)	LC	5	250–400	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN 38002-03, 38021-25; MPUJ 1156-61, ALOP-017, 242-245
33	<i>Hyloscirtus palmeri</i> (Boulenger, 1908)	LC	2, 3, 4,, 5	340–1100		<b>Puerto Boyacá:</b> ICN 38448, 45249-51, 45255-57
34	<i>Scarthyla vigilans</i> (Solano, 1971)	LC		300	Acosta-Galvis et al. (2006)	
35	<i>Scinax caprarius</i> * (Acosta-Galvis, 2018)	–	1, 3	900–1300	Acosta-Galvis (2018)	<b>Otanche:</b> ALOP-124,189-190. <b>Yacopí:</b> ICN 37042, 37052-37055,
36	<i>Scinax rostratus</i> (Peters, 1863)	LC	5	250–400		<b>Puerto Boyacá:</b> MPUJ 1074-75; ALOP-012, 272
37	<i>Scinax ruber</i> (Laurenti, 1768)	LC	5	300–350	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN 44590-94, 45353-60; MPUJ 1072-73; ALOP-137,143
38	<i>Smilisca phaeota</i> (Cope, 1862)	LC		300–360	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> MPUJ 1162-63
39	<i>Smilisca sila</i> (Duellman & Trueb, 1966)	LC		300–360		<b>Puerto Boyacá:</b> ICN 38451-55, 38457-58
<b>Pyllomedusidae</b>						
40	<i>Phyllomedusa venusta</i> (Duellman & Trueb, 1967)	LC	3	300–900	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-105. <b>Puerto Boyacá:</b> ICN 45219-24
<b>Leptodactylidae</b>						
41	<i>Engystomops pustulosus</i> (Cope, 1864)	LC	3, 4, 5	250–900	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-247, 254-255. <b>Puerto Boyacá:</b> ICN 38382, 45299-314; ALOP-010
42	<i>Pseudopaludicola pusilla</i> (Ruthven, 1916)	LC		280	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN 45295-98; IAvH 7277-82
43	<i>Leptodactylus colombiensis</i> * (Heyer, 1994)	LC	3	900		<b>Otanche:</b> ALOP-207. <b>Yacopí:</b> UIS-MHN-A-0489-90
44	<i>Leptodactylus fragilis</i> (Brocchi, 1877)	LC	5	250–400	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ALOP-239. <b>Yacopí:</b> UIS-MHN-A-0506
45	<i>Leptodactylus fuscus</i> (Schneider, 1799)	LC		280–500	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN 45295; MPUJ 855
46	<i>Leptodactylus insularum</i> (Barbour, 1906)	LC		250	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> IAvH 7702
47	<i>Leptodactylus savagei</i> (Heyer, 2005)	LC	5	250		<b>Puerto Boyacá:</b> ALOP-002. <b>Yacopí:</b> UIS-MHN-A-0525
<b>Ranidae</b>						
48	<i>Lithobates vaillanti</i> (Brocchi, 1877)	LC	5	250–300	Acosta-Galvis et al. (2006)	<b>Puerto Boyacá:</b> ICN 45315-16; ALOP-011
<b>Caudata Order</b>						
<b>Plethodontidae</b>						
49	<i>Oedipina</i> sp.*	–	5	450		<b>Otanche:</b> ALOP-057
50	<i>Bolitoglossa lozanoi</i> (Acosta & Restrepo, 2001)	VU	2	250–1200	Acosta-Galvis et al. (2006)	<b>Otanche:</b> ALOP-096, 218. <b>Yacopí:</b> UIS-MHN-A-0561